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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/762,220	03/23/2001	Hideharu Takezawa	10059-371 US	2883

570 7590 05/30/2003

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EXAMINER

TSANG FOSTER, SUSY N

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 05/30/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/762,220

Applicant(s)

TAKEZAWA ET AL.

Examiner

Susy N Tsang-Foster

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-11 and 13-16 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office Action is responsive to the amendment filed on 3/18/2003. Claims 1-8 have been cancelled and claims 9-16 have been added and are pending. Art rejections in the previous office action based on any one of EP 917224 A1, JP 10-255839 A, JP 11-233140 A, and JP 09-223516 A have been withdrawn since these references do not disclose, teach, or suggest the phosphates having formula (2) or formula (3) as recited in the instant claims. This Office Action is made non-final as new grounds of rejection are made that are not necessitated by applicant's amendment.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 9-11, 13, 15, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Gan et al. (US 6,203,942 B1).

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Gan et al. disclose a nonaqueous secondary battery comprising a chargeable and dischargeable positive electrode, a non-aqueous electrolyte containing lithium salt, and a chargeable and dischargeable negative electrode (col. 3, lines 34-59; col. 4, lines 11-19; col. 7, lines 10-32). A phosphate additive is added to the electrolyte having the general formula $(R^1O)P(=O)(OR^2)(OR^3)$ wherein **R¹, R², and R³ are the same or different**, and they can be a **hydrogen atom, or a saturated or unsaturated organic group containing 1 to 13 carbon atoms**. Specific examples of the phosphates are tribenzyl phosphate, dimethyl benzyl phosphate, diethyl benzyl phosphate, dipropyl benzyl phosphate, dibutyl benzyl phosphate, dimethyl phosphate, diethyl phosphate, dipropyl phosphate, dibutyl phosphate, diphenyl phosphate, dibenzyl phosphate, monomethyl phosphate, monoethyl phosphate, monopropyl phosphate, monobutyl phosphate, monophenyl phosphate, monobenzyl phosphate, and **mixtures thereof** are used as additives in the electrolyte (col. 5, line 54 to col. 6, line 10).

The positive electrode can comprise metallic lithium and a carbon material (col. 3, lines 35-45) and the negative electrode can comprise $LiCoO_2$, $LiMn_2O_4$, and $LiNiO_2$ (col. 4, lines 11-18).

It is noted that since the positive and negative electrode inside the battery is immersed and soaked in the electrolyte containing the phosphate additive, the positive and negative electrode will also contain the phosphate additive (col. 7, lines 10-31).

Gan et al. also disclose a method of producing the nonaqueous electrolyte secondary battery comprising the steps of:

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preparing an electrode material comprising an active material, a conductive agent, and a binder and applying the electrode material on a current collector plate (foil) to prepare an electrode (col. 7, lines 17-22); assembling a nonaqueous electrolyte secondary battery using the electrode and a nonaqueous electrolyte where dibenzyl phosphate additive is dissolved in the electrolyte (col. 7, lines 22-31). As stated above, once the cell is activated with the electrolyte having the dissolved phosphate additive, the electrodes which are immersed in the electrolyte would contain the phosphate additive.

4. Claim 14 is rejected under 35 U.S.C. 102(e) as being anticipated by Gan et al. (US 6,203,942 B1) and as evidenced by Electrolyte Datasheet [online]. BEIJING PHYLION BATTERY CO. LTD.[retrieved on 2003- 05-21]. Retrieved from the Internet: <URL: www.fangxiang.com.cn/doce/cpjs_4.htm>.

Gan et al. disclose all the limitations for claim 14 except explicitly stating that the nonaqueous electrolyte contains 0.1 to 20 weight percent of at least one of the phosphate having one or two hydroxyl groups represented by formulas (2) and (3) respectively. In a specific example, 0.05 M dibenzyl phosphate (DBP) which has one hydroxyl group is added to the electrolyte containing EC:DMC:EMC:DEC in a 45:22:24.8:8.2 volume ratio and 1.0 M LiPF_6 (col. 2, lines 52-56 and col. 7, line 28-31). Gan et al. also disclose that the concentration of the phosphate additive in the electrolyte is preferably about 0.001 M to about 0.40 M (col. 10, lines 48-49). Calculations indicate that an electrolyte solution containing 0.05 M dibenzyl phosphate contains 1.02 weight percent of the dibenzyl phosphate which anticipates applicant's claimed range of 0.1 to 20 weight percent. The molecular weight for LiPF_6 is 152 g/mol and the molecular weight for DBP is 278 g/mol. The densities for EC, DMC, EMC, and DEC used in

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the calculations are obtained from the electrolyte data sheet from the BEIJING PHYLION BATTERY CO. LTD. website having values of 1.41 g/cm³, 1.07 g/cm³, 1.00 g/cm³ and 0.972 g/cm³ respectively.

Allowable Subject Matter

5. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

The present invention claims a non-aqueous electrolyte secondary battery wherein at least one of the positive electrode, the nonaqueous electrolyte and negative electrode contains a mixture of two or three phosphates selected from the group consisting of formula (1), formula(2), and formula(3) cited in the instant claims and each phosphate in the mixture comprises not less than 30 volume percent based on the total volume of the mixture.

The closest prior art of record, Gan et al. (US 6,203,942 B1), discloses a nonaqueous secondary battery comprising a chargeable and dischargeable positive electrode, a non-aqueous electrolyte containing lithium salt, and a chargeable and dischargeable negative electrode and a phosphate in the nonaqueous electrolyte satisfying the formula (1), formula(2), and formula(3) of the instant claims and a mixture thereof but the reference does not disclose, teach, or suggest that each phosphate in the mixture comprises not less than 30 volume percent based on the total volume of the mixture.

It is noted that EP 917224 A1, JP 10-255839 A, and JP 11-233140 A were cited as X references in the International Search report dated 8/29/2000 for PCT Application

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PCT/JP00/03581 filed 6/1/2000. These X references no longer apply to the instant claims since they do not disclose, teach, or suggest the phosphate formula(2) or formula (3) required in the claims.

Response to Arguments

7. Applicant's arguments with respect to claims 9-11, and 13-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster, Ph.D. whose telephone number is (703) 305-0588. The examiner can normally be reached on Monday through Thursday from 9:30 AM to 8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900.

The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9310 for regular communications and (703) 872-9311 for After-Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

st/21 May 2003

Susy Tsang-Foster